

common shrew of the continental plain is subspecifically distinct from the representatives of the species occurring in Britain, Scandinavia, or in the mountain-ranges of Europe. The latter are dully coloured forms, whereas the shrew of the plain is a large brilliantly tricoloured form, having a band of intermediate colour interposed on the flanks between the colours of the upper and under surfaces. The appropriate subspecific name for the shrew of the plains would appear to be *S. tetragonurus*, Zimmermann (Geog. Gesch. &c. ii. p. 383, 1780), while Mr. Miller has bestowed on two mountain forms the subspecific names of *alticola* (from Switzerland) and *euronotus* (from the Pyrenean foot-hills)—see Proc. Biol. Soc. Wash., April 25, 1901, pp. 41-45.

Since the dull coloration of the British water-shrew entitles it to subspecific rank, it should be known as *Neomys fodiens ciliatus* (Sowerby), Brit. Misc. t. xlix. p. 103 (1805).

LXVI.—*Notes on European Species of the Subgenus Pitymys*
(Genus *Microtus*). By Dr. C. I. FORSYTH MAJOR.

1. *Microtus (Pitymys) duodecimcostatus* (Selys).

Arvicola duodecimcostatus, De Selys-Longchamps, Rev. Zool., Année 1839, p. 8; id. Etudes de Micromammalogie (Liège, 1839), p. 110, pl. iii. fig. 4 bis.

This species rests on two skeletons, both presenting the anomaly of twelve (instead of thirteen) ribs, which De Selys considered to be a specific character. One of the skeletons is from the neighbourhood of Geneva ("des environs de Genève"); De Selys had received it from the well-known Geneva palæontologist Professor Pictet de la Rive: the second skeleton, in the Paris Museum, is from the neighbourhood of Montpellier. The former, being the first mentioned in both the above-quoted papers, must be considered the type of "*Arvicola duodecimcostatus*."

The specimen from Montpellier was, in 1854, identified by Z. Gerbe as the "*Arvicola incertus*, Selys," from Southern France, and is therefore a *Pitymys*. "Il y a, sous tous les rapports, une si parfaite similitude entre la tête osseuse de l'*A. incertus* et celle du squelette à douze paires de côtes, que le Muséum d'histoire naturelle de Paris tient de M. Olivier, sous le nom de *Mus (Arvicola) æconomus*, que je n'hésite pas à identifier ce prétendu *Mus æconomus*

à l'*A. incertus*; or, comme ce squelette est rapporté par M. de Selys-Longchamps à son *A. duodecimcostatus*, il s'ensuit que cette espèce, dont on ne connaissait que la charpente osseuse, n'est qu'un *A. incertus*, offrant la singulière anomalie de n'avoir que douze paires de côtes et douze vertèbres dorsales au lieu de treize . . ." *.

The Geneva skeleton agreeing, according to what De Selys had originally asserted, in every respect with the one from Montpellier, Gerbe concluded further that "*A. incertus*" occurs also in the neighbourhood of Geneva; in a postscriptum to his memoir, however, he states as follows:—"M. de Selys-Longchamps, dans une lettre en date du 24 juillet dernier, me dit avoir reconnu que le squelette d'*A. duodecimcostatus* qui lui vient de Genève se rapporte à l'*A. Baillonii*, et n'est par conséquent point semblable, comme il l'avait avancé dans ses *Etudes de Micromammalogie*, à celui du Muséum d'histoire naturelle de Paris. Dès que cette similitude n'existe pas, il n'y a plus lieu de supposer que le Campagnol incertain doive se trouver dans les environs de Genève" †.

What, in 1854, De Selys may have meant by "*Arvicola Baillonii*" it is difficult to guess, but it does not matter much. Blasius has "*Arvicola duodecimcostatus*" as a synonym of the *Microtus arvalis* ‡, and is herein followed by V. Fatio §.

The upper and side views of the skull of the Geneva skeleton are represented in the figure 4 *bis* (pl. iii.) of the 'Micromammalogie.' In the great depth of the skull, backward from the rostrum, its longitudinal arching, and the subcylindrical shape of the brain-case it shows so unmistakably the characteristic form of the skull of *Microtus "incertus"* from Southern France, so well described by Gerbe ||, that we may safely consider the skeleton to be that of a species of *Pitymys*, either identical with the *M. "incertus"* as described and figured by Gerbe, or else very nearly related to it; so that the two skeletons of "*Arvicola duodecimcostatus*" may, after all, be one and the same species.

In Fatio's 'Campagnols du Bassin du Léman' no *Pitymys* is recorded; in the same writer's 'Faune des Vertébrés de la Suisse' the only *Pitymys* mentioned from Switzerland is

* Rev. et Mag. de Zool. (2) vi. pp. 370, 371 (1854).

† Op. cit. p. 608.

‡ J. H. Blasius, 'Naturgesch. d. Säugethiere Deutschlands . . .,' p. 379 (1857).

§ V. Fatio, 'Faune des Vertébrés de la Suisse,' i. p. 234 (1869).

|| Rev. et Mag. de Zool. (2) vi. pp. 368, 369, pl. xi. figs. 1 & 2 (1854).

the *Microtus (Pitymys) Savii*, discovered by Pavesi above Lugano in the Canton Tessin*.

When series of complete specimens of both the *Microtus duodecimcostatus* and the "*Arvicola incertus*" of Southern France are to hand a direct comparison will be possible. According to Gerbe the habitat of "*A. incertus*" is the whole of Provence and Languedoc, part of the Roussillon and of the Dauphiné†. In the Basses-Alpes, according to the same writer, it is common in the natural meadows with southern exposure up to a height of almost 2000 metres‡. Gerbe does not state in what part of this extensive region the specimen or specimens described by him were obtained.

Concerning the specific name "*incertus*": even if the Geneva specimen proved to be different specifically from the Southern France form described by Gerbe, the name cannot be retained for the latter unless it could be shown to be identical with a species from the St. Gothard (Switzerland), for which it was originally used by De Selys. At the Second Congress of Italian Scientists convened in Turin in Sept. 1840, De Selys declared "*Arvicola incertus*" to be a species provisionally founded on two specimens from the summit of St. Gothard, which are said to differ from *A. Savii* by larger size, more robust feet, and more yellowish coloration of the skin§. He is more explicit in a communication made at

* V. Fatio, Faune Vert. Suisse, iii. App. pp. vii-ix.—Quite recently (Arch. Sc. Phys. et Nat. (4) xix. pp. 188-198, 1905) Dr. Fatio has made remarks upon *Microtus (Pitymys) subterraneus*, De Selys, from Switzerland. The specimens from the majority of Swiss localities are somewhat hesitatingly referred to a new subspecies or variety, *multipler*. I shall have to take this paper more fully into consideration in a future note, and wish only to mention here that I find myself in disagreement with Dr. Fatio in what he considers to be the cranial characters of typical *M. subterraneus* in specimens from "France":—"Face supérieure de la boîte crânienne subarrondie et assez large en arrière, avec recouvrement plutôt étroit de l'occipital." This applies well to the members of the *duodecimcostatus* group (in which, however, the *m*³ has invariably three internal angles), whereas typical *subterraneus* skulls from Belgium, at my disposal, agreeing with the fig. 2 bis, pl. iii. of the 'Micromammalogie,' have precisely the characters assigned to the new subspecies. Unless Dr. Fatio had before him a new, and as yet undescribed form from some part of France, his supposed typical *subterranei* may be specimens of a species of the *duodecimcostatus* group in which, for one reason or other, the pattern of the *m*³ cannot be made out.

† Rev. et Mag. de Zool. (2) vi. pp. 607, 608 (1854).

‡ Ibid. (2) iv. p. 309 (1852).

§ Atti Seconda Riunione degli Scienziati Italiani tenuta in Torino nel Settembre del 1840, p. 225 (Turin, 1841).

Zurich in the following year:—" *Arvicola incertus* (Selys). Campagnol incertain.—Je signalerai cette espèce nouvelle sur un individu du musée de Zurich, pris dans son nid par monsieur le prof. Schinz, près de l'hospice du St. Gothard, à plus de 6000 pieds d'élévation. Elle y avait formé un magasin composé de racines du saule des Alpes. Il ressemble, par ses oreilles excessivement courtes, à l'*Arvicola Savii* (Selys), espèce qui se trouve dans toute l'Italie; mais il est d'un pelage jaunâtre, à peu près comme l'*arvalis*. Ses pieds à ongles robustes et ses oreilles sont notablement velus, et sa taille est comme celle des grands exemplaires de l'*arvalis*. Si ce n'est pas une espèce distincte, c'est l'*Arvicola Savii* qu'il faudrait alors inscrire dans la faune helvétique.—Monsieur Baillon (d'Abbeville) possède un exemplaire de l'*Arvicola incertus*, provenant des environs de Toulon. Il est semblable à celui du musée de Zurich" *.

The specimen from the St. Gothard described by De Selys was alluded to by Schinz himself in 1837 as a *Microtus arvalis*:—" *Hypudæus arvalis*.—Sie legt auf Ebenen und Bergen Magazine an. Schinz fing diese Maus auf der höchsten Höhe des Gotthardtpasses in den ersten Tagen des August.—Hier legen sie für ihre Grösse beträchtliche Magazine von verschiedenen Wurzelarten an, welche man im Frühling oft noch in grossen runden Haufen angehäuft findet. Diese Wurzeln, von denen man wenigstens drei Arten unterscheiden kann, sind mit Grashalmen vermischt. Auf dem Gotthardt suchen arme Kinder sie begierig auf und essen diese Wurzeln" †.

In his 'Synopsis' Schinz expressly states that this specimen is distinct from his "*Hypudæus rufescente fuscus*, syn. *H. rufo-fuscus*, Schinz," discovered by Nager lower down, in the Urserenthal ‡.

The specimen from the St. Gothard is again mentioned by De Selys as *Arvicola incertus* in 1843, together with specimens from Saint-Zacharie (Var) and from Montpellier §. In his writings of the following years the St. Gothard gradually drops out from the habitat of the "*A. incertus*," and in 1847 the name *Arvicola Baillonii*, which had already done service twice and had been twice relegated to synonymy

* Edm. de Selys-Longchamps, "Note sur les Campagnols (*Arvicola*) de la Suisse," Verh. Schweiz. nat. Ges. 26te Vers. Zürich, p. 188 (1841).

† "Fauna Helvetica. Wirbelthiere von Prof. Schinz," Neue Denkschr. allg. Schweiz. Ges. f. d. ges. Naturw. i. pp. 21, 22 (1837).

‡ H. Schinz, Syn. Mammalium, ii. p. 240, footn. (1845).

§ Rev. Zool. vi. pp. 130, 131 (1843).

—of *M. agrestis** and of *M. arvalis*†,—is revived for the St. Gothard form‡, and, as stated above, in 1854 is applied to the type of *M. duodecimcostatus*.

To sum up: both the specimens on which rests the "*Arvicola duodecimcostatus*, De Selys," are to be assigned—the type on the strength of the figured skull, the Montpellier specimen on the authority of Gerbe—to a characteristic group of the subgenus *Pitymys*, represented by various species from Southern France (also from the Pyrenean Peninsula and from Montenegro). If the type specimen of *Microtus duodecimcostatus* is not forthcoming, we must await the rediscovery of this species in the neighbourhood of Geneva before deciding whether it is or is not specifically identical with the one from Montpellier. In any case the name *duodecimcostatus* (1839) antedates the name *incertus* (1840), the latter, moreover, referring originally to some specimen from St. Gothard, considered by De Selys to be nearly related to *M. Savii*, but which from its size seems rather to be some form of the *M. arvalis* group.

2. *Microtus (Pitymys) lusitanicus* (Gerbe).

Arvicola (Microtus) lusitanicus, Z. Gerbe, Rev. Mag. Zool. (3) vii. pp. 44, 46, 47 (1879); id. Bull. Soc. Zool. France, v. p. 56 (1880).

There would be some justification for ignoring the above specific name proposed by Gerbe, since, according to his own declaration, the species has not been described, but only "signalée"; moreover, the two characters which were made known, viz. small size of the animal—"taille inférieure à celle de toutes les espèces qui vivent en France"§—and reduced condition of the middle outer triangle of *m*³, apply equally well to two distinct species of the Western Pyrenean Peninsula, the one from Galicia, the other from Cintra and presumably other parts of Portugal. Since the former may or may not occur likewise in the northern districts of Portugal, whereas the skull on which the species *M. lusitanicus* rests is from Portugal, I adopt this name for a species

* De Selys-Longchamps, Faune Belge, i. (Liège, 1842) p. 36.

† De Selys-Longchamps, in 'Atti Sesta Riun. Scienz. Ital. tenuta in Milano,' 1844, p. 319 (Milan, 1845).

‡ Rev. Zool. x. pp. 308, 309 (1847). When alluding to the name *A. Baillonii* and to "the Swiss specimen of Schinz" ('Säugethiere Deutschlands,' p. 384) Blasius was not aware that at the Congress of Turin and in the 'Faune Belge' this name was applied to a specimen from the Canton Zurich, and in 1847 to quite another specimen (the one from the St. Gothard), both collected by Prof. Schinz.

§ Rev. Mag. Zool. (3) vii. p. 44, footnote 1 (1879).

represented in the Natural History Museum by fourteen specimens collected at Cintra by Mrs. Mary and Mr. Oldfield Thomas. Mrs. Thomas not only assists her husband during his collecting-trips, but science is further indebted to her for helping in the arrangement of the collections of skulls of small mammals in the Natural History Museum; I have therefore associated her name with the species from Galicia described further on.

Microtus lusitanicus belongs to the same group as *M. duodecimcostatus*, as revealed by the arched upper contour of its skull, its deep, subcylindrical brain-case, the backward shelving of its occipital, its protruding upper incisors, and the absence of closed triangles in m^3 , the middle outer triangle of which is much reduced. The characters of the skull and of the incisors are somewhat less pronounced than in the larger species of the group. Those of m^3 conversely are very well marked: out of the fourteen specimens only in three is the reduction of the middle triangle not so marked as usual—in one (no. 98. 2. 2. 49) this occurs on both sides, in two (nos. 98. 2. 2. 41 and 47) on the right side only. The fusion of the two middle (outer and inner) triangles, leading to the formation of a transverse loop and consequently to the absence of any closed triangle in this tooth, is constant in all the fourteen specimens.

The development of a supplemental triangle on m^2 , more rarely on m^1 also, which is a characteristic feature in adult specimens of several species of the subgenus, is of rather exceptional occurrence in the members of the *duodecimcostatus* group. Out of the fourteen specimens of the present species only two exhibit this pentamerodont character. In one (no. 98. 2. 2. 37) the supplemental triangle is moderately developed on both the m^2 , in the other (no. 98. 2. 2. 47) it is more conspicuous and a beginning of a similar development is visible also on the right m^1 .

Coloration.—Above “bistre”*, some specimens approaching more to “broccoli-brown.” The bistre-coloured are “smoke-grey” below, with a more or less admixture of “buff” in those approaching to “broccoli-brown” in the upper parts. (All the specimens from Cintra are of a decidedly darker coloration above than that exhibited in another species of the *M. duodecimcostatus* group from the neighbourhood of Seville. The largest of these, represented by numerous specimens in the Natural History Museum,

* For names of colours placed in inverted commas see R. Ridgway, ‘A Nomenclature of Colors for Naturalists’ (Boston, 1886).

Collector's Dimensions (in millim.) of the fourteen specimens (nos. 98. 2. 2. 37-50), taken in the flesh.

	..37.	..38.	..39.	..40.	..41.	..42.	..43.	..44.	..45.	..46.	..47.	..48.	..49.	..50.
Head and body..	♂.	♂.	♂.	♂.	♂.	♂.	♂.	♀ jun.	♀ jun.	♀.	♀.	♀.	♀.	♀.
Tail	85	92	98	90	92	87	90	83	81	87	87	93	98	96
Hind foot	27	22	24.2	22	24	26	21	23	22	25	24.5	27	24	25
Hind foot	14.5	14.7	15	15	15.7	15.3	15.3	15	13.8	15	15.1	14.5	15	14.8
Ear	7.5	8.6	8.2	8	8	8	8.4	8.2	7.8	8.5	8.1	8.5	8.5	8.5

Cranial Dimensions of eleven specimens, the Skull of which is complete.

	..37.	..40.	..43.	..41.	..42.	..47.	..50.	..49.	..48.	..45.	..44.
Greatest length	♂.	♂.	♂.	♂.	♂.	♀.	♀.	♀.	♀.	♀ jun.	♀ jun.
Basilar length	21.5	23	22.9	23	22	22	23	22	22	20	20.5
Length of nasals	19.7	20.5	20	20.2	20	19.2	20.7	20	20.2	17.5	18.8
" upper molar series	6	7	7	6.8	6	6	6	..	6	5.2	5.8
" lower "	6	5.9	6.2	6	5.8	5.9	5.8	5.9	5.6	5.1	5.3
Zygomatic breadth	5.8	6	6	5.9	6.2	5.8	5.9	6.2	5.6	5	5.1
Mastoid breadth	13.2	14	14	14	13.8	13.8	14	13.7	13	..	..
Height at occipital	11.2	11.8	11.7	11.8	11.7	11.2	11.2	11.4	11	10.2	10.3
Height between bulla	6	6	6.8	7	6.2	6	6.8	6.5	6.5	6	6
Height between bulla and occipital ..	9	9	9	9	8	8	8.8	8.9	9	8.5	8.6
Fronto-palatal height	8.8	8.8	9	8.8	8.6	8.1	8.8	8	8.5	8.5	7.3

attain the dimensions of *M. ibericus* (Gerbe). Their coloration is above "bistre," with a tinge of "isabella colour," below grey with a strong admixture of "buff.")

Four inguinal mammæ (two on each side) and five foot-pads on the hind sole were noted in the fresh specimens by the collector.

3. *Microtus (Pitymys) Thomasi*, Barrett-Ham.*

The skull of this large species, from Montenegro, bears little resemblance to that of *M. Savii*, and is the very converse of the very low skull of *M. subterraneus*; it agrees in its general features with the members of the *M. duodecimcostatus* group, and likewise in the character of the protruding upper incisors. In the pattern of m^3 there is a tendency towards formation of closed triangles, and the middle outer triangle, with the exception of one specimen (no. 1), is scarcely reduced. Taking the specimens one by one, m^3 exhibits the following characters:—

Collector's no. 85, ad. ♀.—No closed triangles; middle outer triangle scarcely reduced.

Collector's no. 16, ad. ♀.—Outer and inner middle triangles almost closed.

Collector's no. 1, ad. ♂.—The outer and inner middle triangles are closed on the right side; on the left they are confluent, forming a transverse loop. Middle outer triangle reduced.

Collector's no. 86, young ad. ♂.—No closed triangles.

4. *Microtus (Pitymys) Mariæ*, sp. n.

This delicate species is represented in the Natural History Museum by seven spirit-specimens (B.M. nos. 94. 1. 1. 16 and 17; 94. 3. 19. 6–8; 95. 4. 29. 4 and 5) from Viilalva, Prov. Lugo, Galicia, presented by the late Dr. V. L. Seoane.

Coloration.—The specimens, which have been nine years in spirit, show in the adult the upper parts of a brown tinged with "raw umber"; the lower parts are of a shining "buff."

Compared with the members of the *duodecimcostatus* group this form has a narrower, more elongate, rather flattened, low brain-case; zygomatica less spreading; upper incisors not protruding. Apart from its smaller size, the skull resembles that of *Microtus Savii*, exaggerating somewhat the latter's characteristic outline; the upper contour represents an even straighter line, with more abruptly

* Ann. & Mag. Nat. Hist. (7) xi. p. 306 (1903).

shelving nasals. The lateral palatal grooves are deep in the adult. Third upper molar without any closed triangles and with the middle outer triangle much reduced; this tooth shows therefore the characteristic pattern of the *duodecim-costatus* group.

Four inguinal mammae.—Five foot-pads on the hind sole.

Dimensions (in millim.), taken from spirit-specimens.

	Head and body.	Tail.	Hind foot.	Ear.
B.M. no. 95.4.29.5 (adult ♂) . . .	84	25	14.5	7.5
B.M. no. 94.3.19.8 (young ♂) ..	73	24	13	7.5

Dimensions of the Skull.

	94.1.1.16. yg. ad. ♀.	94.1.1.17. ♀ jun.	94.3.19.7. ♀ jun.	94.3.19.8. ♂ jun.
Greatest length	22.9	20.5	20.4	21
Basilar length	19.8	..	17.7	18
Length of nasals	6	6	5.5	5.8
" upper molar series .	6	5.5	5.3	5.5
" lower " " .	5.9	5.4	5.7	5.4
Zygomatic breadth	14	12.6	12.4	12.5
Mastoid breadth	10	..	9.7	10.2
Height at occipital	6	..	5.3	5.5
Height between bulla and occipital	8	7	7.5	8.7
Fronto-palatal height	8	6.8	7	7.5

Type specimen, B.M. no. 94. 1. 1. 16, young adult ♀ (spirit-specimen). Villalva, Lugo, Galicia (N.W. Spain).

LXVII.—*On the Preorbital Pit in the Skulls of Domestic Horses and Quaggas.* By R. I. Pocock, F.L.S., F.Z.S., Superintendent of the Zoological Society's Gardens.

In the 'Annals' for last November (p. 317), when criticising Mr. Lydekker's statements and opinions with regard to the presence of a preorbital pit upon the skulls of horses and quaggas and the systematic value claimed for it, I remarked that its known occurrence in two true quaggas' skulls would to a certain extent justify a provisional generalisation as to its constancy in that animal, were it not that this pit belongs to the category of characters which are likely to appear sporadically as atavisms and are therefore, from the systematic standpoint, open to suspicion on the score of inconstancy; and I added that "such characters are of